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# EET 270T.01: Wireless Communications

Steve Shen

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Missoula College UM  
Department of Applied Computing and  
Electronics  
Course  
Syllabus

**Wireless Communications EET 270T**

Credits: 4

Prerequisites: EET 205 Solid State Electronics I

Term: Autumn 2013

**Meetings:**

Lectures Mon, Wed & Fri 1:10PM – 2:00PM; Labs Tue 1:10PM to 3:00PM Classroom: HB05

**Final Exam:** Wednesday December 11, 2013 from 1:10PM to 3:10PM

**Faculty Contact:**

Steve Shen – [steve.shen@umontana.edu](mailto:steve.shen@umontana.edu)  
Office Hours: Monday 11:00AM to 12:00PM  
Wednesday 3:00PM to 4:00PM  
Thursday 12:00PM to 1:00PM

Phone: 406-243-7914

**Course Description:**

**EET 270T Wireless Communications 4 cr.** Offered autumn. Prereq., EET 205. Explores audio and radio frequency (RF) circuits. Topics include AM and FM signal modulation and demodulation, RF transmitters, RF receivers, RF amplifiers, audio amplifiers, oscillators, mixers, and antennas. Includes hands-on labs.

**Course Overview:**

Most of the discussion of new topics, reviews and lab activities will take place in the classroom-lab. Some of the student's activities will have to take place outside of the classroom. Lab write-ups, some written homework and/or take-home quizzes will be assigned throughout the semester. Students are advised to read ahead in the text and lab books to prepare for new topics, and to review material already covered in class. Note taking is strongly encouraged with particular emphasis on *definitions* of terms and the new *schematic symbols, formulas, and solved problems* that use those formulas. These will almost always be included on the tests given at the end of each chapter. We will be covering the first 7 chapters, and chapters 10 and 14 (if time allows) in the text and do many of pertaining labs to each chapter. This course also includes an AM-FM radio kit build project. This is built in segments with performance tests and measurements throughout the build. When completed the students should be able to tune in the 4 Missoula AM channels and at least 4 of the FM channels.

**Please note the lab portion of this course is included under the one course heading.**

**Course Objectives:**

Upon completion of this course students will:

- Be able to describe general circuit configurations for Audio and RF Amplifiers
- Understand the characteristics of AM modulation and detection.
- Understand the characteristics of FM modulation and detection.
- Be able to describe signal levels in terms of decibels
- Be able to calculate RF signal wavelength
- Have a general understanding of digital communication techniques

- Have a general knowledge of radio transmitters
- Have a general knowledge of wireless communication receivers
- Know how to read and understand the frequency spectrum chart
- Have a basic understanding of how to calculate antenna dimensions and RF wavelength for specific frequencies
- Successfully construct a functioning AM-FM radio during their lab exercises. Two thirds credit for successfully completing the assembly segments and passing the performance tests and measurements given in the manual. The full one third of the remaining credit is awarded for successfully receiving 4 AM and 4 FM radio stations.

#### **Required Materials:**

Electronic Communications, A Systems Approach; Jeffrey S. Beasley, Jonathan D. Hymer, Gary M. Miller; Pearson 2014, ISBN 978-0-13-298863-6

Laboratory Manual to accompany Electronic Communications, A Systems Approach; Jeffrey S. Beasley, Jonathan D. Hymer, Gary M. Miller; Pearson 2014, ISBN 978-0-13-301066-4

EET 270T Parts kit (available in the Bookstore)

Apaco AM-FM Radio kit (available in the Bookstore)

#### **Evaluation Procedures:**

Grades will be assessed as follows: Assessment Area:

Attendance	10%
Homework Assignments	10%
Midterm Exam	20%
Final Exam	30%
Lab Experiments	15%
AM-FM Radio Project	15%

#### Grading Scale:

90-100%	A
80-89%	B
70-79%	C
60-69%	D

#### **Academic Integrity:**

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at: [http://life.umn.edu/vpsa/student\\_conduct.php](http://life.umn.edu/vpsa/student_conduct.php)

Using the Web to research materials and concepts is an integral part of learning in the twenty-first century. Studying with other students is a productive method of learning. A certain amount of collaborating on concepts with other students and using resources found on the Internet in an assignment is recommended. Copy and paste is not acceptable. It is expected that each student will input his/her assignment into the computer, and each student must be able to explain any assignment turned in. Collaboration on exams is strictly forbidden.

#### **Dropping and Adding Courses or Changing Sections, Grading or Credit Status:**

University Policy for dropping courses or requesting grading/credit status changes can be found in the catalog or on the web <http://www2.umn.edu/catalog/acpolpro.htm#adding>. All students should be familiar with the policy.



**Disability Accommodations:**

Eligible students with disabilities will receive appropriate accommodations in this course when requested in a timely way. Please contact me after class or in my office. Please be prepared to provide a letter from your DSS Coordinator.

For more information, visit the Disability Services website at

<http://www.umat.edu/dss> or call 406.243.2243 (voice/text).

**Changes to Syllabi:**

NOTE: Instructor reserve the right to modify syllabi and assignments as needed based on faculty, student, and/or environmental circumstances. If changes are made to the syllabus, amended copies will be dated and made available to the class.

**Exam, Quiz, and Homework Assignment Policy:**

All quizzes, lab write-ups and homework assignments are to be completed on-time.

Labs and Homework assignments that lag the course schedule by more than one chapter will not be accepted for credit. Exams are only to be taken on the assigned date.

Rescheduling of an exam will be approved at the discretion of the instructor, only in extraordinary situations and if the instructor is notified by phone in advance that you are not able appear on exam day.

**Technical Support for Online Students:**

Technical support is available through <http://umonline.umat.edu> and by telephone at 406.243.4357 for the IT Central Help Desk and 406.243.6394 for Blackboard specific questions.

**Topic Outline (tentative):**

1. Fundamental Communications Concepts
2. Amplitude Modulation
3. Angle Modulation
4. Communications Circuits
5. Transmitters
6. Receivers
7. Antennas
8. Digital Communications Techniques
9. Wireless Communications Systems